

ABSTRACT

A method of manufacturing an oxide dispersion strengthened ferritic steel excellent in high-temperature creep strength having a coarse grain structure is provided. This method comprises mixing either element powders or alloy powders and a Y_2O_3 powder, subjecting the mixed powder to mechanical alloying treatment, solidifying the resulting alloyed powder by hot extrusion, and subjecting the resulting extruded solidified material to final heat treatment involving heating to and holding at a temperature of not less than the Ac_3 transformation point and slow cooling at a rate of not more than a ferrite-forming critical rate to thereby manufacture an oxide dispersion strengthened ferritic steel which comprises, as expressed by % by weight, 0.05 to 0.25% C, 8.0 to 12.0% Cr, 0.1 to 4.0% W, 0.1 to 1.0% Ti, 0.1 to 0.5% Y_2O_3 with the balance being Fe and unavoidable impurities and in which Y_2O_3 particles are dispersed in the steel. In this method, by using a TiO_2 powder as an element powder of a Ti component to be mixed at the mechanical alloying treatment or by additionally adding an Fe_2O_3 powder, the bonding of Ti with C is suppressed so that the C concentration in the matrix does not decrease. As a result, α to γ transformation during the heat treatment is ensured and it is possible to manufacture an oxide dispersion strengthened ferritic steel having a coarse and equiaxed grain structure effective in improving high-temperature creep strength.